

The Roles of Patients' Internet Use for Cancer Information and Socioeconomic Status in Oncologist-Patient Communication

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The majority of US adults are Internet users, and they increasingly search for online health information, particularly regarding specific diseases.¹ Many seek cancer treatment and clinical trial information.^{2,3} Although few studies have evaluated patients' Internet use for health information,² critics debate its influence on the physician-patient relationship and health care disparities.

Increasingly, patients broach online information in physician-patient interactions, sometimes directly confronting physicians with such information. That said, access to basic additional information may empower patients in physician-patient interactions.⁴ Observers agree that patients' Internet use encourages active patient communication,⁵ although they continue to debate the pros and cons of the practice.^{4,6} Table 1 summarizes those arguments.

Contending that the Internet is "inherently democratic"⁷ implies that simply making more health information available online will reduce health care disparities.^{8,9} However, evidence of a digital divide based on socioeconomic status (SES)^{10,11} raises concerns that differential access to online health information may widen the knowledge gap and, thereby, exacerbate health care disparities, because those in greatest need (eg, with a preventable disease yet no insurance) are least likely to have Internet access.¹²

Little research has investigated the impact of patients' Internet use on the physician-patient relationship and health care disparities; instead, it has been limited to patients' or physicians' perceptions rather than actual behavior.¹³ A nationally representative patient sample rated the use of online health information as having positive effects on the physician-patient relationship.¹³ However, a survey of primary care patients found no relationship between interest in health-related Internet use and patients' perceptions of physician-provided information and patient involvement in decision-making.¹⁴ Results of physician surveys are equally unclear.^{15,16}

Even less is known about these issues in oncology settings. Regardless of Internet use,¹⁰ patients with cancer report receiving insufficient information about their disease, want more information,^{17,18} and want to participate actively in medical care. Oncology patients who use the Internet are

more likely than oncologists to perceive that such use improves their relationship.^{19,20} However, we found no previous research that directly observed effects of oncology patients' Internet use on actual physician-patient communication.

With regard to SES, patients with cancer generally mirror Internet health information users: younger, wealthier, and better-educated patients are more likely to seek Internet-based cancer information.^{20,21} A survey of economically disadvantaged patients with cancer at an urban county hospital found no association between income and Internet use; however, it relied on an imprecise proxy for patient income (median income by zip code).²

We conducted a study and collected data at the H. Lee Moffitt Cancer Center (Tampa, Florida) and the Barbara Ann Karmanos Cancer Institute (Detroit, Michigan). In our study of 123 patients visiting these two National Cancer Institute (Bethesda, Maryland)-designated comprehensive cancer centers, significant differences were found between those who sought cancer information from the Internet and those who did not. SES was estimated by multiplying the level of education (from 1 [= no formal education] to 11 [= completed graduate degree]) by the response to the income question (from 1 [$<$ \$10,000] to 6 [$>$ \$100,000]). Internet users were younger, better educated, had higher income, and thus had higher SES (Table 3). Internet use also was positively associated with using other cancer information sources (Table 4).

Patients' Internet use for cancer information also was positively associated with specialized knowledge, physician-patient connectedness/closeness, and likelihood of patients using technical language (Tables 2 and 5). However, after we controlled for SES, these relationships were no longer statistically significant. That is, initial significant correlations between Internet use and knowledge and communication variables masked the impact of SES on Internet use.

The Internet As Prescription for Health Disparities: Missing the Mark?

One federal government strategy to improve health care and reduce health disparities is to increase household Internet access and access to credible online cancer information sources (e-mail, LiveHelp, and www.cancer.gov).^{8,22,23} Findings from the above-mentioned study suggest this strategy may miss the mark. First, 43% of patients we studied

Table 1. The Debate: Pros and Cons Regarding the Impact of Patients' Internet Use on Health Care

Pros	Cons
Helps physician-patient relationship	Harms physician-patient relationship
Educates patients	Patients interpret information incorrectly
Empowers patients to interact as partners	Physicians' authority undermined
Facilitates patients' involvement	Physicians feel challenged
Facilitates patients' taking responsibility	Enhances patients' anxiety
Improves patients' satisfaction	Creates distrust
Improves patients' adherence	Creates conflict
Results in better treatment decisions	Creates unrealistic patient expectations
More efficient service use	Increases length of interactions
Improves medical outcomes	Patients try inappropriate treatments

had never used the Internet to locate cancer information. Thus, even among patients at premier cancer treatment venues, Internet use for cancer information is hardly the norm. Worse, when the cancer patient population is disproportionately older and/or of minority status (both factors associated with SES), they are less likely to use the Internet and, according to previous research, more likely to use one-way or noninteractive information sources (eg, mass

media entertainment sources, often with unrealistic portrayals) that disallow tailoring to meet individuals' information needs.²⁴ Second, access to online cancer information assumes general and health literacy, the ability to evaluate Web site and information credibility, and Internet search and navigational skills,⁶ factors also likely associated with SES. Thus, simply increasing physical "access" to the Internet does not ensure patients' capabilities to locate and

Table 2. Karmanos Accrual Analysis System: Physician-Patient Relationship Global Ratings

Relationship Dimension	Definition
Hierarchical rapport	Extent to which the physician preserves his or her status as a medical expert with arrogance versus cordiality
Connectedness/closeness	Degree of warmth and affinity between physician and patient
Trust	Degree to which patient appears to have confidence in physician's integrity, ability, and judgment and extent to which physician seems to recognize and respond
MD code	Degree to which physician uses technical language v nontechnical lay person-oriented language
PT code	Degree to which patient uses technical language v nontechnical lay person-oriented language
MD code matching	Degree to which physician matches the patient's language
MD responsiveness to PT concerns/questions	Extent to which physician invites and responds to patient comments, questions, and concerns
MD directedness	Extent to which physician guides discussion toward having patient sign the consent form
MD talkovers	Extent to which physician interrupts and/or talks over patient
MD conversational control	Extent to which physician dominates talk v engages in conversational turn-taking
MD information giving	Amount and adequacy of information physician provides to patient
MD manner of delivery	Extent to which physician's presentation of treatment options appears orderly/organized
MD information orientation	Extent to which physician presents information using scientific studies, facts, and statistics v personal opinion to support recommendations
MD hope	Extent to which physician attempts to provide hope, focusing on potential positive outcomes

Abbreviations: MD, physician; PT, patient.

Table 3. Demographic Characteristics of Total Sample, Internet Never-Users, Sometimes-Users, and Everyday Users

Variable	Total (n = 123)	Never (n = 53)	Sometimes (n = 50)	Everyday (n = 20)
Sex, %				
Male	58.2	50.0	62.0	70.0
Female	41.8	50.0	38.0	30.0
Age, years				
Range	22–87	22–87	25–83	22–71
Mean	57.9	61.8	55.8	52.8
SD	13.5	13.9	11.7	14.7
Race/ethnicity, %				
White	87.0	79.2	92.0	95.0
Black	8.9	17.0	4.0	0.0
Hispanic	0.8	0.0	2.0	0.0
Asian	0.8	1.9	0.0	0.0
Other	0.8	1.9	0.0	0.0
Unknown or prefer not to answer	1.6	0.0	2.0	5.0
Education, %				
Completed grade school	3.3	3.9	4.0	0.0
Some high school	10.7	15.7	6.0	10.0
Completed high school	28.1	39.2	24.0	10.0
Some trade/technical school	4.1	7.8	0.0	5.0
Completed trade/technical	7.4	9.8	6.0	5.0
Some college	22.3	13.7	30.0	25.0
Completed college	13.2	5.9	14.0	30.0
Some graduate school	0.8	0.0	0.0	5.0
Completed graduate school	9.9	3.9	16.0	10.0
Annual household income, %				
< \$10,000	9.9	19.6	4.3	0.0
\$10,000 to \$19,999	13.5	17.4	10.9	10.5
\$20,000 to \$39,999	18.0	21.7	13.0	21.1
\$40,000 to \$59,999	19.8	17.4	23.9	15.8
\$60,000 to \$100,000	27.0	15.2	30.4	47.4
> \$100,000	11.7	8.7	17.4	5.3
SES				
Range	3–66	3–55	4–66	10–60
Mean	28.2	20.0	33.4	34.7
SD	16.6	14.0	16.4	15.7

Abbreviation: SES, socioeconomic status.

understand credible cancer information needed to empower them in interactions with oncologists.

Internet Use As a Stand-in for Literacy and More Informed Networks?

Because patients' cancer information Internet use was associated with using other cancer information sources, one

might surmise that Internet users are simply higher information seekers than nonusers.²⁵ Two pieces of evidence indicate otherwise. First, the factor analysis suggested that Internet use was associated more with using interpersonal than electronic information sources. Second, across all variables studied, Internet use correlated most highly with SES and use of newspapers, books, and personal networking.

Table 4. Factor Loadings for Cancer Information Sources

Cancer Information Source	Factors	
	Electronic	Interactive
Television talk shows	0.88	0.05
Radio	0.84	0.14
Family	0.05	0.90
Friends	0.24	0.87
Internet	0.33	0.51
Television news magazine	0.81	0.40
Television news	0.61	0.48
Newspaper	0.53	0.51
Books	0.59	0.45
Magazines	0.61	0.50
Eigenvalue	5.38	1.24
Variance, %	53.76	12.38
Cumulative % of variance	53.76	66.14

Thus, a reasonable explanation of relationships between Internet use and other information-source use rests on SES. Higher SES individuals are not only better educated and better off financially, but also more literate and, thus, better able to readily access print-based media (eg, the Internet for health information purposes). They are also more likely to encounter better-educated and better-informed people in their personal networks than are nonusers and may be more likely to have a highly trained health professional in their personal networks who can talk knowledgeably with them about cancer.

Carrying the Internet into Health Care

The initial study results suggested some effects of Internet use on oncologist-patient communication. Internet use was

positively associated with physician-patient connectedness/closeness and patient use of technical language (factors that suggest greater patient participation) and with knowledge about science. However, when we controlled for SES, these relationships were no longer significant. Thus, our results suggest that SES, rather than empowerment from online cancer information, drives both patients' level of specialized knowledge and relational aspects of physician-patient communication.

In conclusion, simply increasing Internet access is unlikely to reduce disparities in health care and in health care interactions that contribute to disparities.⁸ Internet use, along with other factors comprising social class (ie, education and income), may simply multiply advantages for some patients during medical interactions. The challenge is for researchers to identify, and physicians to use, communication strategies to address the corresponding disadvantages to which the Internet contributes to reduce health care disparities.

The primary clinical implication of our findings is that physician-patient interaction may differ as a function of patient SES rather than Internet use. Patients' failure to seek online information, potentially interpreted by physicians as lack of interest or desire for information, may actually reflect the patients' socioeconomic status and related health disparities rather than a lack of interest. To help reduce these disparities, physicians can foster patient participation directly by encouraging them to ask questions and discuss concerns, and indirectly, by asking patients about their information interests and accessible sources. They also can match patients' information needs and preferences to resources (ie, answer questions, provide print information at an appropriate reading level, and identify credible cancer information Web sites).

Table 5. Relationships Between Internet Use for Cancer Information and Specialized Knowledge and Physician-Patient Communication Dimensions

Variable	<i>r</i>	<i>df</i>	<i>P</i>	<i>pr</i>	<i>df</i>	<i>P</i>
Behavioral Sciences	0.31	122	<.01	0.15	107	.12
Natural Sciences	0.20	122	.03	< 0.05	106	.63
Physical Sciences	0.26	122	<.01	0.12	107	.20
Medicine	0.13	122	.15	0.06	106	.57
Connectedness/closeness	18.0	123	<.05	0.12	107	.22
Patient code	-0.20	123	<.05	-0.04	107	.71
Age	-0.26	123	<.01	-0.28	107	< .01
Education	0.35	121	<.001			
Household income	0.33	111	<.001			
SES	0.41	110	<.001			

Abbreviations: *r*, correlation between variables; *pr*, partial correlation while controlling for SES (education × income); *df*, degrees of freedom; SES, socioeconomic status.

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